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(54) BEER KEG TAPPING DEVICES

(71) We, THE PERLICK COMPANY, INC., of 8300 West Good Hope Road, Milwaukee, Wisconsin, United States of America, a Company organized and existing under the laws of the State of Wisconsin, United States of America, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to beer keg tapping devices.

More particularly, the invention relates to keg tapping devices of the kind comprising two complementary sections or units, one of which is in use fixed to the keg and in effect becomes a permanent part thereof, while the other remains at the dispensing site and is coupled to the keg unit when the keg is tapped. Examples of this type of tapping device will be found in United States Patent Specifications Nos. 3,228,413, 3,231,154 and 3,430,553, and in British Patent Specification No. 930,015.

According to this invention, there is provided a beer keg tapping device comprising a keg unit mountable in the tapping hole of a beer keg and having a gas passage through which, in use, pressurised gas can be supplied to the interior of a keg to which the unit is fitted and a beer passage through which, in use, beer can flow from the keg, both passages being normally closed by a single movable valve element biased to its closed position, and a coupler unit having a gas passage connectible to a source of pressurised gas and a beer passage connectible to a dispensing tap, the coupler unit being releasably connectible to the keg unit so that the gas passage and beer passage in the keg unit are placed in communication with the gas passage and beer passage respectively of the coupler unit, in which the coupler unit comprises a tubular body which upon connection of the coupler unit to the keg unit stands erect, a centrally disposed sleeve in the tubular body to provide the beer passage, the sleeve being joined at its upper end to the tubular body and having its lower end so located as to engage the valve element of the keg unit and move it from its closed position as the coupler unit is connected to the keg unit, the sleeve being formed with a construction the upward facing surface of which forms a valve seat, a check valve movable in the sleeve above the constriction and spring-biassed towards the valve seat, and means on the check valve engageable with a part of the keg unit to unseat the check valve when the coupler unit is connected to the keg unit.

While the tapping device of this invention lends itself well to the attainment of reliably sanitary beer dispensing conditions, reduction or elimination of the possibility of beer being sprayed or splashed from the keg during the tapping operation is one of its most significant attributes.

Another advantage of the device of this invention is the ease with which the tapping operation can be performed.

Still another advantageous feature of the tapping device of this invention is that it permits series connection of a plurality of kegs without introducing turbulence-producing flow restrictions.

The invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a side view with a part broken away and in section, of a beer keg fitted with a keg unit in accordance with this invention and showing a coupler unit adjacent thereto in position to be attached to the keg unit,

Figure 2 illustrates the series connection of a plurality of kegs using the keg unit and coupler unit of Figure 1.

Figure 3 is a view partly in elevation and the remainder in section, showing a keg tapping device in position on a keg of the kind shown in Figure 1,

Figure 4 is a sectional view through the keg unit of Figure 1 showing the keg unit installed in the tapping hole of the keg,

Figure 5 is a view similar to Figure 4, but showing a modified keg unit for use with a keg having a tapping hole of a different form from that of the keg of Figure 1,

Figure 6 is a perspective view of the tapping hole portion of a keg of the kind shown in Figure 1 and the keg unit of Figure 4 in position to be assembled with the keg, and

Figure 7 is a cross-sectional view on line 7-7 of Figure 3, through the assembled keg unit and tapping hole portion of the keg to illustrate how the keg unit is secured against accidental or unauthorized removal from the keg.

Referring to the accompanying drawings, the kegs 6 shown in Figures 1 and 2 are typical of one type of keg used in the sale of draught beer. Another type of keg is shown in Figure 5. Except for the size of the tapping hole and the manner in which tapping devices are secured therein, the two types of keg may be the same, and often are. Depending upon the size of the dispensing system, beer is dispensed from these kegs either singly, or with the kegs connected in series as shown in Figure 2.

As is well known, gas pressure is employed to force the beer from the kegs. Hence every tapping device must have a liquid passage connectible with a dispensing faucet, as shown in Figure 2, and a gas passage that is connectible with a source of gas, also as shown in Figure 2. Where beer is drawn from only one keg at a time, the relative sizes of the liquid and gas passages is not too important as long as the liquid passage has adequate flow capacity, but when a number of kegs are connected in series between the dispensing faucet and the source of gas pressure, the flow capacity of the gas passage should be at least as large as that of the liquid passage. The tapping devices shown in the drawings has that feature.

As shown in the drawings, each tapping device comprises two connectible units, a keg unit 8 and a coupler unit 9. Both units have beer and gas passages that are respectively communicated when the units are coupled together. As described below, valve means which includes a movable valve element held seated by spring pressure and the pressure within the keg, automatically closes the passages in the keg unit and keeps them closed until the keg is tapped by attaching the coupler unit to the keg unit.

An important feature of the tapping devices is that the passages in the two units are joined or communicated before the valve element which closes the passages in the keg unit is unseated. This prevents beer from being sprayed or splashed from the keg during the tapping operation. The manner in which this is accomplished is fully described below but — before doing so — it should be understood that the keg unit is supplied in two different forms, respectively to fit the tapping hole of the two types of keg (shown respectively in Figures 1 to 4, 6 and 7 and in Figure 5), while the coupler unit fits both keg units.

THE KEG UNITS

Both keg units have a tubular body designated generally by the numeral 10, which is secured in the tapping hole of the keg and has an externally threaded upper end portion onto which a wing nut 11 is threaded to secure the coupler unit in place on the keg unit, as shown in Figure 3.

For kegs of the type shown in Figure 5, the body 10 is one integral barrel 12 with an externally threaded medial portion 13 larger in diameter than its threaded upper end portion, to screw into the internally threaded collar 14 which surrounds the tapping hole in the keg. Below this medial threaded portion 13 the barrel is reduced in diameter to provide a shoulder to oppose an upwardly facing shoulder in the collar 14 with a gasket 15 clamped therebetween.

For kegs of the type shown in Figures 1 to 4, 6 and 7, the body 10 is in two parts, an inner part 16 and an outer part 17. The inner part 16 is essentially a two diameter barrel or sleeve, the larger diameter portion of which is at the top and has an outwardly directed flange 18 at its upper end. The outer body part 17 is a ring into which the inner part is threaded with a gasket 19 between its flange 18 and the top of the ring. It is this ring which provides the externally threaded upper end portion of the body and has the wing nut 11 threaded thereon.

The smaller diameter bottom end portion of the inner body part is of a size to snugly fit into the tapping hole of the keg with an O-ring therebetween for sealing purposes. The junction between the top and bottom portions of the inner body forms a downwardly facing shoulder 20 which seats upon the top of the neck 21 that surrounds the tapping hole and has a flange 22 at its upper end to provide downwardly facing circumferentially inclined ledges leading from diametrically opposite gateways 23 in the flange 22 to vertical abutments 24 projecting from the side

of the neck. This structure is best illustrated in Figure 6.

The manner in which the keg unit for kegs of the type shown in Figures 1 to 4, 6 and 7 is attached to the keg is also best shown in Figure 6. For this purpose, the outer ring-like body part 17 has two diametrically opposite hook-like lugs 25 that pass through the gateways 23 and engage under the inclined ledges upon rotation of the unit. Such rotation, which is limited by the engagement of the lugs with the abutments 24, draws the body of the unit tightly down onto the neck 21.

A retaining device holds the body against retrograde rotation from its tightened-down position. This retaining device consists of a semi-circular spring wire bail 26 with inturned ends 27 and an indented medial portion 28. The bail embraces the lower end portion of the ring-like outer body part and has its inturned ends protruding through diametrically opposite holes 29 that are so located with respect to the lugs 25 that the protruding ends of the bail engage the sides of the vertical abutments 24 opposite those engaged by the hook-like lugs 25. Downward displacement of the medial portion of the bail is prevented by engagement of its indentation 28 with the lowermost of the adjacent external threads. This secures the keg unit against accidental or unauthorized detachment from the keg. Only someone familiar with the unit and possessing an appropriate tool can remove the same from the keg.

It has now been shown how the keg units are attached to kegs of both types, and it should be borne in mind that, in both cases, the body 10 has exactly the same size externally threaded upper end portion to fit the wing nut 11 by which the coupler unit is secured to the keg unit. But for the coupler unit to be inter-changeably connectible with the keg units on both types of keg, more needed. The valve means by which the beer and gas passages in the keg unit are controlled must be alike in structure and operation whether the keg unit is for one type of keg or the other, so that as the units are coupled, the beer and gas passages of the keg unit will be respectively joined to the beer and gas passages of the coupler unit.

Accordingly, the body 10 has a straight bore 30 in its upper end portion of the same diameter for both types of keg unit, and a coaxial tube 31 that rises from a wall 32 at the bottom of the body. The tube is solidly secured to the wall 32, either by a threaded connection, as shown, or in any other suitable manner. The lower end portion of the tube 31 has a plastic extension 33 attached thereto to reach the bottom of the keg.

The tube 31 forms the beer passage of the keg unit and the space between the tube and the encircling wall of the body forms its gas passage, the upper end portion of which is defined by the straight uniform diameter bore 30. In the keg unit of Figures 1 to 4, 6 and 7, communication between the gas passage and the keg interior is provided by diametrically opposite openings 34 which result from slabbing off the bottom end portion of the inner body part 16; and in the version of Figure 5, holes 35 in the wall 32 provide the needed communication between the gas passage and the keg interior.

A valve element 36 comprising a hub 37 and a disc 38 on the upper end of the hub, is slidably mounted on the tube 31 for movement between a "seated" position defined by is collision with the bottom edge of a cap 39 that is threaded onto and closes the upper end of the tube 31, and an "unseated" position. A coil spring 40 encircling the tube 31 and confined between the wall 32 and the bottom of the hub 37, yieldingly holds the valve element in its "seated" position. In this position the valve element closes both the beer passage and the gas passage.

Closure of the beer passage results from the hub 37 covering ports 41 in the upper end portion of the tube 31, and closure of the gas passage is effected by sealing engagement between the valve disc 38 and the wall of the bore 30. An O-ring 42 seated in a groove in the periphery of the disc, provides the seal between the disc and the wall of the bore until the valve element is depressed a distance sufficient to carry the O-ring out of the bottom end of the bore 30 and into a larger counterbore 43. Entry of the disc 38 with its encircling O-ring into the counterbore creates a large capacity annular passageway through which gas — or beer in the case of series connected kegs — may freely flow to and through the openings 34 and/or 35 into the keg.

O-rings 44 and 45 respectively above and below the ports 41, engage the wall of the bore in the hub of the valve element to provide a liquid-tight seal between the valve element and the tube 31. The top ring 44 prevents leakage of beer from the keg when the valve element is in its upper passage-closing position which, for convenience, has been defined as the seated position of the valve element, despite the fact that the valve element does not coact with a valve seat in the conventional manner. The bottom ring 45 prevents gas in the keg above the beer level and/or from the source of gas pressure, leaking into the beer being dispensed — which, of course, necessitates the coupler unit being in place

and the valve element being "unseated".

In the "unseated" position of the valve element 36 at which its disc is in the counterbore 43, the ports 41 in the tube 31 must be uncovered. To meet this requirement and still keep the keg unit desirable short, the valve element has a counterbore 46 opening to its upper end, the bottom of which is slightly below the ports 41 in the "unseated" position of the valve element. The diameter of this counterbore is large enough to accept the cap with considerable clearance therebetween, when the valve element is in its raised seated position, and for a purpose to be presently described, the counterbore is stepped to form a socket 47 with a straight cylindrical side wall.

THE COUPLER UNIT

The coupler unit comprises a generally cylindrical tubular body 50 with a cylindrical sleeve 51 coaxially disposed therein. At their upper ends the body and sleeve are connected by having the upper end portion of the sleeve enlarged and threaded into the body, as at 52; but for the most part, the sleeve is spaced from the inner wall of the body to provide the gas passage of the unit. Its beer passage, which is formed by the sleeve, leads to a nipple 53 attached to the upper end thereof by confining an enlarged end portion of the nipple in a counterbore in the sleeve by means of a coupling nut 54 threaded onto the sleeve. An O-ring 55 provides a leakproof connection between the nipple and the sleeve.

Medially of its ends, the sleeve has a constriction 56, the upper surface of which provides a conical seat for a check valve 57 by which back flow of beer is prevented when the coupler unit is detached from a keg unit. The valve 57 is biased to its seated position by a spring confined between the valve and the bottom of the nipple, and preferably the valve is of the type that has an O-ring positioned to engage the valve seat. When the valve is seated, a pin 58 projecting from the bottom thereof collides with the cap 39 at the top of the tube 31 of a keg unit and thereby unseats the valve as the units are connected.

Near its bottom end, the tubular body 50 has an encircling flange which seats upon the upper end of the body of the keg unit and is clamped thereto by the wing nut 11 which freely rotatably encircles the body 50 and is confined against any substantial upward displacement by a retaining ring 59. The lower end portion of the tubular body 50 is of a size to telescope into the bore 30 of any keg unit body and the bottom end of the sleeve 51 is of a size to snugly fit into the socket 47 in the valve element 36 of any keg unit. preferably, the bore of the sleeve has the same diameter as the counterbore 46 in the valve element, so that when the units are coupled together, a smooth continuous passage conducts the beer from the keg unit into the coupler unit.

To seal the connection between the beer passage of the two units, an O-ring 60 encircles the bottom end portion of the sleeve which enters the socket 47 in the valve element, and to seal the connection between the gas passages of the two units, an O-ring 61 is seated in a groove in the lower end portion of the tubular body to engage the wall of tthe bore 30 of the keg unit.

Near the upper end of the tubular body 50 there are two diametrically opposite, preferably aligned tapped holes 62. One of these holes has a hose nipple coupling 63 screwed into it to enable the gas passage of the coupler unit to be connected with a source of pressurized gas, or with the beer line from another keg if two or more kegs are connected in series. The coupling 63 is equipped with the customary check valve, not shown.

The other tapped hole 62 has a conventional relief valve screwed into it.

COUPLING THE UNITS TO TAP A KEG

Tapping of the keg simply involves inserting the bottom end of the coupler unit into the body 30 of the keg unit and tightening the wing nut. Since the gas and beer passage of the two units are coaxial, no special rotational orientation of the units is needed. As the coupling unit is set onto the keg unit and drawn down by tightening the wing nut 11, the bottom of the sleeve 51 engages and unseats the valve element, i.e. depresses it to uncover the ports and move the valve disc out of the bore 30. Because of the dimensional relationship that exits between the connectible parts of the two units, during the tapping operation, the O-ring 60 encircling the bottom end of the sleeve 51 enters the socket 47 in the valve element 36 to seal the junction of the beer passages of the two units before the valve element is depressed far enough to uncover the ports 41. Hence it is impossible for beer to splash or spray out of the keg as it is being tapped.

Also, before the valve disc leaves the bore 30, the O-ring 61 on the bottom end portion of the tubular body 50 moves into sealing engagement with the bore 30 to seal the junction between the gas passages of the two units.

Tapping a keg is thus a safe and very simple operation.

As noted hereinbefore, if two or more kegs are to be connected in series, the beer

line leading from the beer discharge nipple 53 of one keg, is connected with the gas inlet nipple 63 of another keg, so that beer flows from the first keg into the second. In this connection it is significant that the gas passages of the coupler and keg units have relatively large capacity and are free of turbulence-producing restrictions.

WHAT WE CLAIM IS:—

1. A beer keg tapping device comprising a keg unit mountable in the tapping hole of a beer keg and having a gas passage through which, in use, pressurised gas can be supplied, to the interior of a keg to which the unit is fitted and a beer passage through which, in use, beer can flow from the keg, both passages being normally closed by a single movable valve element biased to its closed position, and a coupler unit having a gas passage connectible to a source of pressurised gas and a beer passage connectible to a dispensing tap, the coupler unit being releasably connectible to the keg unit so that the gas passage and beer passage in the keg unit are placed in communication with the gas passage and beer passage respectively of the coupler unit, in which the coupler unit comprises a tubular body which upon connection of the coupler unit to the keg unit stands erect, a centrally disposed sleeve in the tubular body to provide the beer passage, the sleeve being joined at its upper end to the tubular body and having its lower end so located as to engage the valve element of the keg unit and move it from its closed position as the coupler unit is connected to the keg unit, the sleeve being formed with a constriction the upward facing surface of which forms a valve seat, a check valve movable in the sleeve above the constriction and spring-biassed towards the valve seat, and means on the check valve engageable with a part of the keg unit to unseat the check valve when the coupler unit is connected to the keg unit.

2. A device as claimed in claim 1, wherein the means to unseat the check valve when the coupler unit is connected to the keg unit comprises a pin extending from the check valve through the constriction in the sleeve, and a cap closing one end of a tube defining the beer passage of the keg unit, said pin abutting against the cap.

3. A device as claimed in claim 1 or claim 2, wherein the keg unit is adapted for use with a keg having a tapping hole surrounded by a neck formed at its upper end with an annular flange formed with gate-way-forming interruptions at circumferentially spaced locations, and a plurality of circumferentially spaced abutments on the neck, the keg unit having a body including a cylindrical lower end portion of a size to snugly fit into the tapping hole of the keg, said cylindrical lower end portion projecting down from a shoulder on the keg unit body which in use seats upon the top of the neck that surrounds the tapping hole of the keg, hook-shaped lugs on the keg unit body projecting down from said shoulder so as, in use, to pass through the gateway-forming interruptions and, upon rotation of the body, to engage the underside of said flange and to engage respective ones of the abutments on the neck, and means for preventing rotation of the keg unit body back to a position aligning its hook-shaped lugs with said gateway-forming interruptions, comprising a spring wire bail with inturned ends embracing the lower end portion of the keg unit body with the inturned ends thereof protruding in use into the interior of the lower end portion of the keg unit body at sides of two of said abutments opposite from the sides of the abutments engaged by the adjacent hook-shaped lugs.

4. A beer keg tapping device as claimed in claim 1 constructed, arranged and adapted to operate substantially as described with reference to and as shown in Figures 1 to 4, 6 and 7 or Figure 5 of the accompanying drawings.

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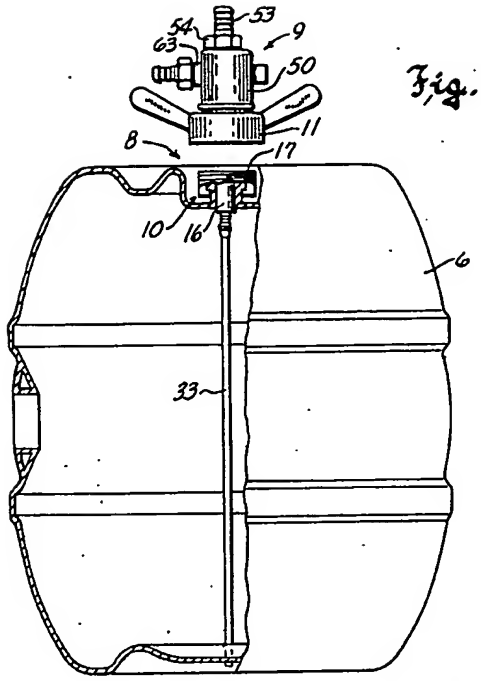

Fig. 1.

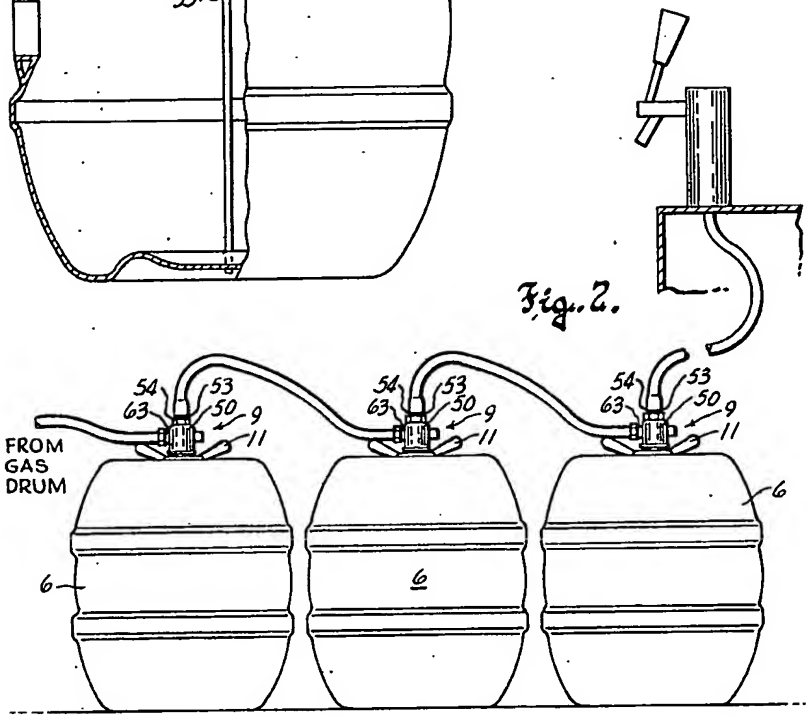

Fig. 2.

Fig. 3.

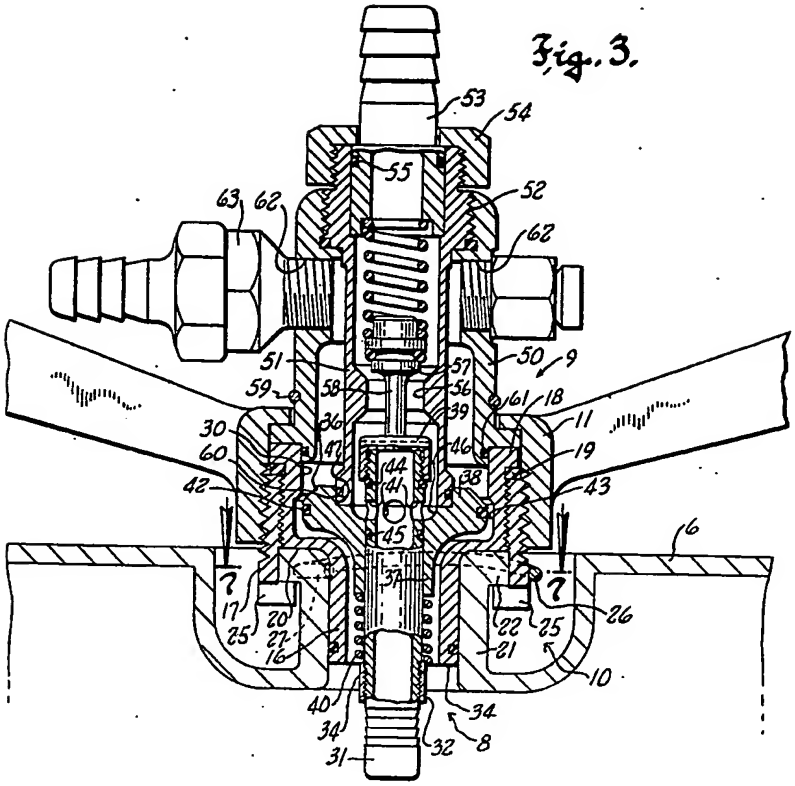
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Fig. 7.

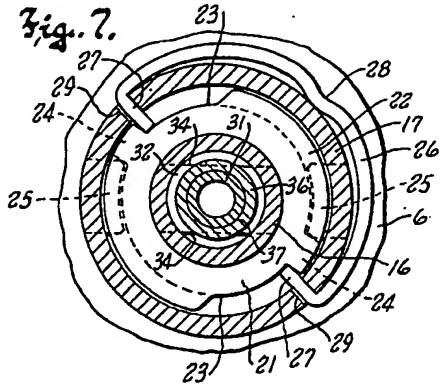
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Fig. 4.

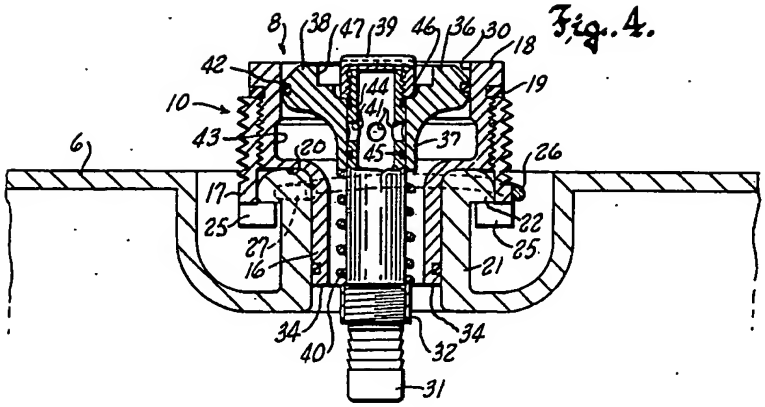
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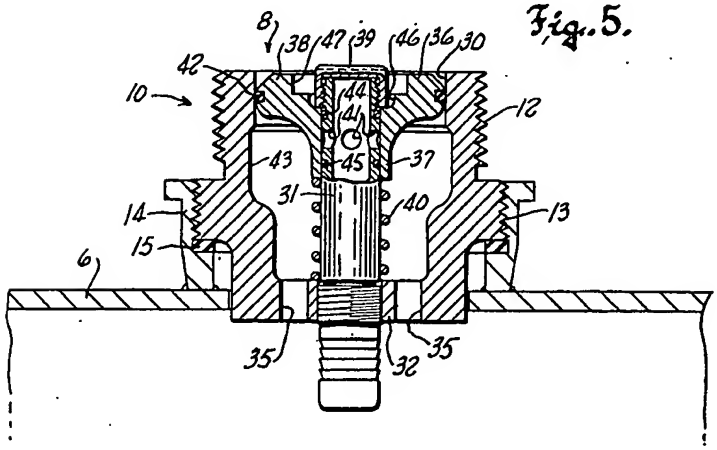
Fig. 5.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1348654 COMPLETE SPECIFICATION
4 SHEETS This drawing is a reproduction of the Original on a reduced scale
Sheet 4

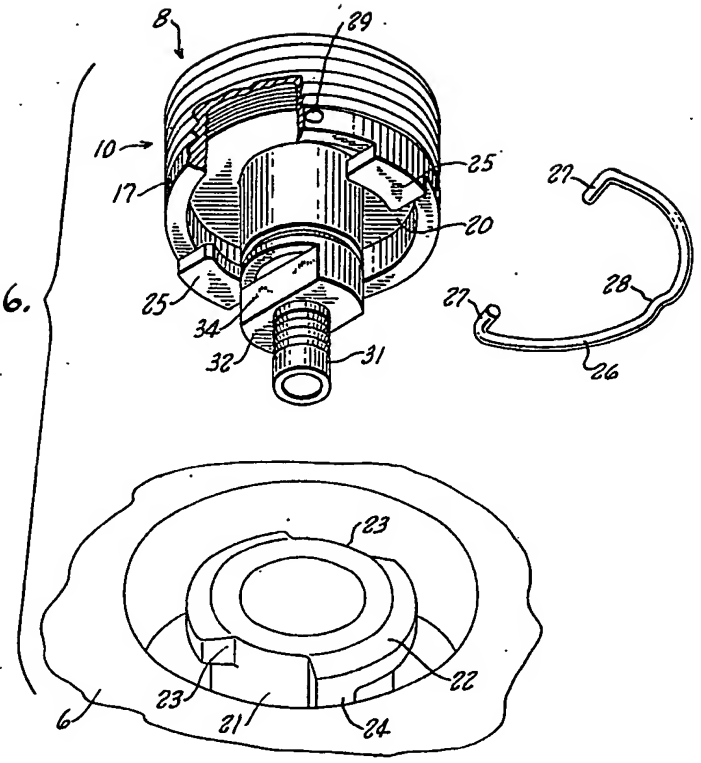

Fig. 6.